



**Evaluation of Harvest Aid Chemical Treatments on Late-Season
Hail Damaged Cotton - 100% Defoliated**

Wells, TX - 2003

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Summary: No significant differences were observed for any of the parameters measured at this location (Tables 1 and 2). Lint yields ranged from a high of 478 lb/acre to a low of 367 lbs/acre for Prep at 16.0 oz/acre applied 5 days after hail event (DAHE) and Finish 6 Pro at 24 oz/acre applied at 10 DAHE respectively. A test average of 421 lbs of lint/acre was observed. Loan values for the test averaged \$0.4485/lb of lint which resulted in a \$189.60/acre test average lint value. After adding lint and seed values, the total values (\$/acre) ranged from a high of \$270.35/acre to a low of \$196.00/acre. Costs for harvest aid chemicals ranged from a high of \$30.90/acre for Finish 6 Pro at 32 oz/acre plus Ginstar EC at 4.0 oz/acre to a low of \$5.66/acre for Gramoxone Max at 5.5 oz/acre plus non-ionic surfactant at 0.25% v/v (4.8 oz/acre). Net values were calculated by subtracting ginning and chemical costs from the total values and ranged from a high of \$213.64/acre, for the untreated check, to a low of \$133.87/acre for Finish 6 Pro applied 10 DAHE at 24 oz/acre, a difference of \$79.77/acre. Results from this study indicate that, under these conditions, use of harvest aids did not increase net return.

Objective: The objective of this project was to evaluate the effect of various harvest aid chemicals and rates, alone and in tank mixes, on yield, fiber quality and economic return when applied to cotton after a late season hail event.

Materials and Methods:

Variety: Deltapine 5690RR
Planting date: May 25
Experimental design: Randomized complete block with 4 replications
Plot size: 4 rows by 50 feet
Hail event date: September 7
Defoliation percent: Cotton was 100% defoliated by hail
Harvest aid treatments:

Treatment number and description

Treatments applied 5 days after hail event (Sept 12)		Chemical cost (\$/acre)
1	Untreated Check	\$0.00
2	Prep @ 16.0 oz/acre	\$9.74
3	Prep @ 16.0 oz/acre + Ginstar EC @ 4.0 oz/acre	\$15.70
4	Prep @ 24.0 oz/acre	\$12.86
5	Prep @ 24.0 oz/acre + Ginstar EC @ 4.0 oz/acre	\$18.82
6	Prep @ 32.0 oz/acre	\$15.98
7	Prep @ 32.0 oz/acre + Ginstar EC @ 4.0 oz/acre	\$21.94
8	Finish 6 Pro @ 16.0 oz/acre	\$14.22
9	Finish 6 Pro @ 16.0 oz/acre + Ginstar EC @ 4.0 oz/acre	\$20.18
10	Finish 6 Pro @ 24.0 oz/acre	\$19.58
11	Finish 6 Pro @ 24.0 oz/acre + Ginstar EC @ 4.0 oz/acre	\$25.54
12	Finish 6 Pro @ 32.0 oz/acre	\$24.94
13	Finish 6 Pro @ 32.0 oz/acre + Ginstar EC @ 4.0 oz/acre	\$30.90
14	Gramoxone Max @ 8.0 oz/acre + 0.25% v/v Non-Ionic Surfactant (NIS)	\$6.36
15	Gramoxone Max @ 21.0 oz/acre + 0.25% v/v Non-Ionic Surfactant (NIS)	\$10.00

Treatments applied 10 days after hail event (Sept 17)

16	Prep @ 24.0 oz/acre	\$12.86
17	Prep @ 24.0 oz/acre + Ginstar EC @ 4.0 oz/acre	\$18.82
18	Finish 6 Pro @ 24.0 oz/acre	\$19.58
19	Finish 6 Pro @ 24.0 oz/acre + Ginstar EC @ 4.0 oz/acre	\$25.54
20	Gramoxone Max @ 5.5 oz/acre + 0.25% v/v Non-Ionic Surfactant (NIS)	\$5.66

Chemical cost (\$/acre) includes a \$3.50/acre application cost.

Application information:

Dates:	September 12 for treatments 1 through 15 (5 days after hail event) September 17 for treatments 16 through 20 (10 days after hail event)
Sprayer:	Lee Spider sprayer with CO ₂ charged, 4 row multi-boom attachment
Nozzle type:	TeeJet® Flat Fan
Nozzle size:	11002 VS with 50 mesh screens
Nozzle spacing:	20 inches
Ground speed:	3.0 MPH
Spray volume:	15 gallons/acre
Operating pressure:	26 psi
Harvest:	Plots were harvested on October 15 with a modified John Deere 482 plot stripper with integral digital scales. Plot yields were adjusted to lb/acre.
Gin turnout:	Grab samples were taken by plot and ginned at the Texas A&M Center at Lubbock to determine gin turnouts.
Fiber analysis:	Lint samples were submitted to the International Textile Center (ITC) at Texas Tech University for HVI analysis, and USDA loan values were determined for each treatment by plot.
Ginning costs and seed values:	Ginning costs are based on \$2.25 per cwt. of bur cotton and seed values are based on \$125 per ton. Ginning costs do not include checkoff.
Chemical costs:	Chemical costs were determined for each treatment using an average retail price for chemicals and adding an application cost of \$3.50/acre.

Results and Discussion:

No significant differences or obvious trends were observed for any of the parameters measured at this location (Tables 1 and 2). Lint yields ranged from a high of 478 lb/acre to a low of 367 lbs/acre for Prep at 16.0 oz/acre applied 5 days after hail event (DAHE) and Finish 6 Pro at 24 oz/acre applied at 10 DAHE respectively. A test average of 421 lbs of lint/acre was observed. Loan values for the test averaged \$0.4485/lb of lint which resulted in a \$189.60/acre test average lint value. After adding lint and seed values, the total values (\$/acre) ranged from a high of \$270.35/acre to a low of \$196.00/acre. Costs for harvest aid chemicals ranged from a high of \$30.90/acre for Finish 6 Pro at 32 oz/acre plus Ginstar EC at 4.0 oz/acre to a low of \$5.66/acre for Gramoxone Max at 5.5 oz/acre plus non-ionic surfactant at 0.25% v/v (4.8 oz/acre). Net values were calculated by subtracting ginning and chemical costs from the total values and ranged from a high of \$213.64/acre, for the untreated check, to a low of \$133.87/acre for Finish 6 Pro applied 10 DAHE at 24 oz/acre, a difference of \$79.77/acre. Results from HVI analyses indicated no significant differences among treatments at this location. Micronaire values averaged 2.8 units, which resulted in low loan values. Staple values ranged from a high of 34.2 (32^{nds} inches) to a low of 33.2 with a test average of 33.6. A test average of 29.4 g/tex was observed for fiber strength. Results from this study indicate that, under these conditions, use of harvest aids did not increase net return. It should be noted that decisions should not be based solely on the results from one location.

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Table 1. Agronomic and economic results for harvest aid chemical treatments on late-season hail damaged cotton, Wells, TX 2003

Treatment	Open boll		Bur cotton yield	Gin turnout		Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Chemical cost	Ginning cost	Net value
	7 dait	18 dait		lint	seed									
	percent	percent	lb/acre	percent	percent	lb/acre	lb/acre	\$/lb	\$/acre	\$/acre	\$/acre	\$/acre	\$/acre	\$/acre
1	27.3	34.0	2088	21.2	35.7	452	759	0.4685	213.16	47.45	260.61	0.00	46.97	213.64
2	34.0	38.3	2223	21.5	39.5	478	880	0.4495	215.34	55.00	270.35	9.74	50.01	210.60
3	32.0	33.5	1848	21.1	36.4	392	674	0.4560	178.80	42.10	220.89	15.70	41.58	163.61
4	36.3	39.8	1997	20.4	36.2	408	725	0.4365	178.49	45.30	223.78	12.86	44.94	165.98
5	30.3	31.3	1913	21.5	36.8	410	704	0.4544	186.23	44.02	230.24	18.82	43.04	168.38
6	34.5	33.8	2283	20.7	37.0	473	845	0.4519	213.64	52.83	266.47	15.98	51.37	199.12
7	39.5	40.5	1809	20.9	35.5	378	644	0.4504	170.30	40.23	210.54	21.94	40.70	147.90
8	26.8	33.3	1991	20.3	35.3	410	709	0.4560	186.70	44.33	231.03	14.22	44.80	172.01
9	27.0	33.8	2062	20.7	36.3	429	749	0.4514	194.09	46.83	240.92	20.18	46.39	174.35
10	31.5	33.8	1964	21.9	36.7	431	723	0.4376	189.37	45.20	234.57	19.58	44.19	170.81
11	32.8	33.3	2093	21.5	36.1	453	758	0.4525	205.63	47.36	252.99	25.54	47.08	180.37
12	28.0	33.5	1983	21.4	36.4	424	722	0.4506	191.55	45.11	236.66	24.94	44.62	167.10
13	36.5	42.3	1961	21.6	37.3	425	732	0.4521	192.84	45.76	238.60	30.90	44.13	163.57
14	29.0	27.8	2023	21.1	35.6	429	723	0.4406	191.36	45.17	236.52	6.36	45.52	184.64
15	32.8	22.3	1856	19.8	33.4	370	622	0.4563	169.12	38.87	207.99	10.00	41.76	156.23
16	36.3	31.8	1902	19.3	34.3	369	654	0.4353	161.17	40.89	202.06	12.86	42.79	146.41
17	42.8	38.3	2046	21.5	36.2	441	742	0.4361	193.00	46.39	239.39	18.82	46.03	174.54
18	24.3	34.3	1891	19.6	35.2	367	661	0.4238	154.67	41.33	196.00	19.58	42.56	133.87
19	31.5	29.5	2104	21.3	36.9	450	780	0.4356	196.89	48.76	245.65	25.54	47.34	172.78
20	36.0	26.8	2031	21.7	36.7	441	750	0.4748	209.74	46.87	256.61	5.66	45.70	205.25
Test avg.	32.4	33.6	2003	20.9	36.2	421	728	0.4485	189.60	45.49	235.09	16.46	45.07	173.56
CV, %	36.9	31.6	13	8.8	5.7	20	17	5.5	22.9	16.6	21.4	--	13.1	25.8
OSL	0.8825	0.6692	0.6488	0.8659	0.1379	0.8678	0.3986	0.5045	0.8662	0.3977	0.8216	--	0.6494	0.6062
LSD 0.05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	NS	NS

* Open boll for treatments 16 through 20, which were applied 5 days after initial treatment, were taken at 2 and 13 days after treatment.

CV - coefficient of variation.

OSL - observed significance level, or probability of a greater F value

LSD - least significant difference.

Assumes:

\$2.25/cwt ginning cost.

\$125/ton for seed.

\$3.50/acre application cost

Value for lint based on CCC loan value from grab samples and ITC HVI results.

Table 2. HVI fiber property results for harvest aid chemical treatments on late-season hail damaged cotton, Wells, TX 2003.

Treatment	Micronaire	Length	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	inches	32 ^{nds} inches	percent	g/tex	percent	grade	reflectance	yellowness	digit 1	digit 2
1	3.0	1.05	33.7	80.6	30.0	6.1	1.0	74.8	10.3	2.3	2.0
2	2.8	1.06	33.8	80.5	29.7	6.4	1.0	75.0	10.4	2.3	2.0
3	3.0	1.05	33.6	81.1	29.4	6.3	1.0	74.9	10.3	2.3	2.0
4	2.7	1.06	33.8	80.4	29.0	6.5	1.0	74.8	10.5	2.3	2.0
5	2.9	1.05	33.7	80.1	28.8	6.3	1.0	75.2	10.6	2.3	2.0
6	2.8	1.05	33.7	80.3	29.7	6.4	1.0	74.8	10.5	2.3	2.0
7	2.8	1.06	33.9	80.5	29.8	6.3	1.0	75.3	10.4	2.0	2.0
8	2.8	1.05	33.7	80.2	30.1	6.4	1.0	74.0	10.3	2.8	1.8
9	2.8	1.07	34.1	80.4	29.3	6.3	1.0	75.3	10.3	2.3	2.0
10	2.9	1.04	33.3	80.3	29.4	6.3	1.0	75.0	10.6	2.0	2.0
11	2.9	1.04	33.2	80.3	29.1	6.6	1.0	75.2	10.5	2.0	2.0
12	2.8	1.05	33.6	81.0	29.5	6.5	1.0	75.1	10.5	2.0	2.0
13	2.8	1.05	33.7	80.5	30.0	6.4	1.0	75.3	10.5	2.0	2.0
14	2.8	1.04	33.4	80.1	30.5	6.4	1.3	74.7	10.4	2.0	2.0
15	2.8	1.05	33.7	80.1	29.6	6.5	1.0	74.9	10.6	2.3	2.0
16	2.7	1.06	33.8	80.3	28.4	6.5	1.0	75.1	10.5	2.0	2.0
17	2.8	1.05	33.4	80.1	29.5	6.4	1.0	75.1	10.6	2.0	2.0
18	2.7	1.04	33.4	80.1	28.5	6.4	1.0	75.0	10.5	2.0	2.0
19	2.7	1.04	33.4	80.7	28.5	6.3	1.0	75.1	10.4	2.0	2.0
20	3.0	1.07	34.2	81.0	30.0	6.3	1.3	74.9	10.3	2.5	2.0
Test avg.	2.8	1.05	33.6	80.4	29.4	6.4	1.0	75.0	10.4	2.2	2.0
CV, %	7.3	1.7	1.0	1.0	3.6	4.2	15.6	1.1	2.3	15.3	5.6
OSL	0.7247	0.6243	0.6373	0.8926	0.2979	0.6357	0.5499	0.9384	0.3216	0.1152	0.4750
LSD 0.05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

CV - coefficient of variation.

OSL - observed significance level, or probability of a greater F value.

LSD - least significant difference.